

Gold in the News

A look at recent media stories concerning gold science and technology

Xerox Research Centre Look at Printed Gold Films

The Xerox Research Centre of Canada in Ontario has been looking at various gold nanoparticles as printable precursors for fabricating conductive elements in printed electronics. The gold nanoparticle features were printed using stencil and microcontact techniques and then converted into highly conductive features for thin-film transistors (TFTs) at relatively low annealing temperatures. The encouraging performance displayed by these materials was attributable to the presence of alkanethiol stabilizers on the printed electrode surface, which enabled intimate electrode/semiconductor interfacial interactions.

Gold Nanoparticles Could Aid Bone Tissue Repair

Researchers from the Department of Bionanosystem Engineering, Chonbuk National University, South Korea have been studying the growth of hydroxyapatite on self-assembled collagen gold nanoparticles. Analysis confirms that the characteristic functionalities of collagen are intact even after the conjugation with gold nanoparticles. The result showed that gold nanoparticles with collagen form an efficient matrix for the growth of hydroxyapatite and the mineralized collagen can be potentially applied in bone tissue repair and regeneration.



Wool and Cotton Coloured with Gold Nanoparticles

At the international conference on nanotechnology and smart textiles at the Royal Society, in London during December 2006, Professor Jim Johnston from the School of Chemical and Physical Sciences, Victoria University of Wellington, New Zealand, gave a talk entitled "Gold Nanoparticles as Colorants and Functional Entities in High Fashion Textiles". Professor Johnston and his colleagues have demonstrated that New Zealand Merino wool fibres and cotton fibres could be coloured using gold nanoparticles to give a stable coloured fibre. When the gold nanoparticles were removed from the colloidal environment and chemically bound to the fibres the possibility of Ostwald ripening and agglomeration of the nanoparticles taking place was removed, so that the colour on the fibre was stable. For both wool and cotton the gold nanoparticles readily chemically bonded to the fibres to produce strong bonds. They also produced stable colourfast properties with a wide range of colours, thus giving opportunity to develop new fashion fabrics and textiles coloured by gold with high associated value.



Gold-Platinum Electrocatalysts in Fuel Cells

Scientists at the U.S. Department of Energy's Brookhaven National Laboratory have added gold clusters to the traditional platinum electrocatalyst in fuel cells, so demonstrating enhanced durability in an accelerated stability test. The test was conducted under conditions similar to those encountered in stop-and-go driving in an electric car. The research was reported in the January 12, 2007, edition of the journal *Science* and a recent patent application.

In the Brookhaven experiment, the platinum electrocatalyst remained stable with potential cycling between 0.6 and 1.1 volts in over 30,000 oxidation-reduction cycles, imitating the conditions of stop-and-go driving. It is believed the gold clusters protected the platinum from being oxidized. This research was funded through the U.S. Department of Energy's Hydrogen Program, a five-year program that began in 2003 to sponsor research, development, and demonstration of hydrogen and fuel cell technologies.

Chemical Sensors from Gold Nanoparticles and Dendritic Polymers

Researchers at Sony have reported on the vapour sensing properties of Au-polymer films built of Au-nanoparticles and 1st and 2nd generation dithiolane terminated polyphenylene dendrimers (PPh). Toluene, 1-propanol, tetrachloroethylene (TCE) and water were used to generate vapours of analytes with different polarity, which allowed the study of the structure-response relationship in the AuPPh system.

New Gold Catalysis Patents

New patent applications relating to the field of gold catalysis have included EP 1724012 *Catalyst containing gold on ceria-manganese oxide* (Degussa AG), US 2006/0293175 *Surface stabilised gold nanocatalysts* and WO2007007075 *Improvements in catalysts* (Cardiff University).

Patents can be downloaded free of charge from <http://ep.espacenet.com>

Gold Catalysis Promotion

World Gold Council and Project AuTEK, based at Mintek in South Africa, plan to promote recent developments in gold catalysis at the forthcoming 20th NAM catalysis meeting in Houston Texas this June, www.20nam.org. The meeting is a premier scientific event in the field of catalysis and a forum for the discussion of relevant technological issues and state of the art research. Researchers interested in gold catalysis are invited to visit the Council's booth in the industrial trade show during the conference. For more information contact: industry@gold.org

Australian Skyscraper Opens with Gold Coated Glazing

Eureka Tower, the second tallest residential building in the world, which has 24 carat gold plated glass windows on the top 8 floors of the building, was officially opened on October 11, 2006. The gold glazing coating is used to retain heat in the winter, but reflect heat in the summer. The tower is a residential building in the Southbank precinct of Melbourne, Australia. The building stands 297.2m in height (300m above sea level), with 91 storeys above ground plus one basement level. It is one of only six buildings in the world with 90 or more storeys.



The Eureka Tower